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• EDITORIAL •

The Excess Profits Tax

While the man in the street generally regards the Excess Profits Tax Act as good legislation, there are many who think otherwise and although it is yet early to give rulings on many points which are at present very obscure, it would seem that perhaps the Act has been rather hurriedly conceived.

At all events the Department will be kept extraordinarily busy in giving rulings on many points and there will be many allegations concerning the unfairness of the Act.

There are, however, many misunderstandings about the Act. For instance, it is understood in many quarters that it applies when the profit for 1940 and succeeding years, so long as it is in force, is higher than the average for the past four years.

As a matter of fact this would lead one to believe that if a company had shown a profit in only one of the four years, the average profit would be the profit for that year divided by four, which is incorrect.

Years where a loss occurred are thrown out and thus the average profit would be that profit made in the only year in which a profit was made.

Even in this case there is provision for the average profit being at least a normal return on capital, but in this case the matter has to be referred to a Board of Referees and such cases will be decided individually on their merits.

Many rulings will be made which will undoubtedly clarify situations which at present appear much befogged and Accountants and Executives generally will have to exercise a little patience before all the headaches, and they are many, are ironed out.

The Powell-Sirois Report

Of late there seems to be an inclination to take the Rowell-Sirois Report much more seriously than was formerly the case and there is evidence that something will be done to implement the proposals of that report before long. To those who have studied this report, this will be good news for there are many things contained therein which would assist the country in the years immediately following the war and for that reason should be put into effect now. In any event, it would be well to bring these proposals out into the open and to discuss them now and to see how they can be of benefit to the Canadian people as a whole.

It is anticipated that the report will be discussed at the present session of the Canadian Parliament and the proceedings as they concern this report will undoubtedly be watched with considerable interest by those who have the welfare of the country at heart.

Across the Secretary's Desk

The past week has been a very hectic, although also a most pleasureable one.

Starting with the big Joint Meeting in Hamilton on November 6th, when members of the Toronto, Hamilton, Niagara and Kitchener chapters assembled to hear our Dominion President, Don. Patton, C.A., speak on the Problems of Aircraft Costing. It was a grand meeting and was enjoyed by everyone present, including Don himself. The next noon Don and I journeyed to Kitchener where we had lunch and held a conference with some of the directors of the Kitchener Chapter headed by that irrepressible Chairman, Dan Seebach.

It was a very enjoyable function and I believe will result in much good to the Kitchener Chapter in particular and to the Society in general.

Immediately following this conference we motored to London and after going over Don's talk for that evening met the London Directors at dinner at the Hotel London. From there we went to a meeting of the London Chapter where forty-five were present to hear our President speak on "The Distribution and Control of Overhead". Here again was a most enjoyable evening and it did not end with the meeting, for a number of the members came over to the hotel where the discussion continued until a very late hour.

At this meeting were several of the staff of the School of Business Administration of the University of Western Ontario and they persuaded Don to address the students at the University next morning, so after an early breakfast, there we went.

The staff of the University were most kind and expressed considerable interest in the work of our Society.

Following the talk to a combined class, your President and I motored to Windsor. There we met a mutual old friend in Jim Masterson, a former chairman of the Montreal Chapter. Then to the hotel and the dinner and meeting of the Windsor Chapter at 6.30 p.m.

While both the Hamilton and London meetings were something to remember, I really think this Windsor meeting was the most successful of any.

It was well attended; there were over thirty for the dinner and over forty for the meeting, but it was not so much the size of the meeting as the most intelligent way in which the discussion period was held. It was a very lengthy meeting and I know Don took away with him a very high regard for this Windsor Chapter.

Following the regular meeting a Student Section was organized and I have great hopes for the very real success of this phase of the Windsor operations.

It was very late when we got to our room and of course there was much to talk about. As a matter of fact, it was after 2 a.m. when we finally got to bed, and that was Standard Time. As I had to return to Hamilton quickly I left word for a call at 5.30 a.m., but Don stayed on. He had some very uncomplimentary remarks to make next morning about those who got up in the middle of the night and fell over things and generally disturbed sleepy people, and when I left he was just turning over for another spell of sleep.

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I know of nothing we have ever done which I think will have such good results as this rather hectic trip.

Everyone was captivated by our President whose unassuming manner, genial disposition and ability to discuss so many things left a deep impression on the many members who were fortunate enough to meet him.

It was a trip to be remembered, and I know that it will have a real good effect on those Chapters who were fortunate enough to participate in all the proceedings.

Last evening I attended a meeting of the Hamilton Student Section at which were present Dan Seebach, Chairman of the Kitchener Chapter, and Jack Henderson, Immediate Past Chairman, together with a number of students of the Kitchener Chapter.

These fellows came down to Hamilton in order to see exactly how the Hamilton Section went about their business, and they were extremely pleased and impressed by what they saw and heard. So much so that a Kitchener Student Section is being organized immediately, and what is more, it gives every promise of being a most successful one.

Right now I am off to Ottawa to form a Chapter in that area and will possibly return in time to give you some information concerning the success of this effort.

Principles of Standard Costs

An Address Delivered Before Windsor Chapter, Canadian Society of Cost Accountants and Industrial Engineers, November 8th, 1940 by

D. R. PATTON, C.A.

A Standard Cost System is that type of Cost Accounting System used where predetermined standards are compiled and subsequently compared with actual costs, and the differences or variances used to measure and control the efficiency of the manufacturing operations.

The Standard Cost System is designed to determine:

- (a) Standard Costs;
- (b) Actual Costs;
- (c) Variances of Actual from Standard Costs, and
- (d) Analysis of and responsibility for those variances.

The cost variances provide a measurement of the operating efficiency of the plant, furnishing the management with information enabling them to examine cost differences as they arise and providing important aid in the control of the costs of production and in the determination of business policies for the coming periods.

Standard Cost Accounting concerns all operations of the plant, from the making of the initial purchase to the final analysis of the operating profit.

Comparison With Other Forms of Cost Accounting.

The peculiar difference and advantage of Standard Cost Accounting arises from its introduction of constants on the basis of which to compare actual accomplishment.

Not only are actual costs determined, but through the use of constants and the analysis of variances, valuable information of efficiency in production is disclosed.

PRINCIPLES OF STANDARD COSTS

Constants or Standards are also used in Estimating Cost Systems, but in that case the estimated costs are not based upon scientific analysis, but are rather opinions as to what the production costs will be, and any differences are taken to indicate an inaccuracy in the estimate used.

Standard Cost Accounting assumes that the Standards are correct, that actual performance that meets the Standard is satisfactory, and that only exceptions from the standards require attention.

Advantages of a Standard Cost System.

The principal advantages resulting from the use of Standard Cost Accounting are:

- (a) The costs are predetermined before production has been completed. The historical aspect of the Cost figures becomes of relatively less importance.
- (b) The comparison with Standards and the analysis of Cost Variances, is of great assistance in disclosing efficient or inefficient operation. Attention is focused on the "exception".
- (c) Price and production policies may be formulated in advance.
- (d) Standards provide incentives to workmen and supervisors.
- (e) Standards reduce the details which are necessary in calculating costs and usually result in a saving in the "cost of Cost Accountancy".

Application of Standard Cost Accounting.

Standard Costs are applicable not only where standard products are manufactured, but also in the production of special types of merchandise. They may be used to advantage either with Process or Job Cost Methods, but must be carefully planned to fulfill the requirements of each particular case.

Information Demanded from a Standard Cost System.

The Standard Cost System is called upon to supply:

- (a) Standard Costs, scientifically determined by elements of cost, and which may be subdivided by departments or operations or products, and which can be used for determination of selling prices and for making comparisons with actual costs.
- (b) Actual Costs, determined as production advances, in the same detail as the Standards.
- (c) Variances of the Actual Costs from the predetermined Standards.
- (d) Analysis of the variances, the causes and responsibility for them, and the measurement which they give of the efficiency of the manufacturing, administrative, and selling divisions of the business.

Definition of Standard Cost.

The Standard Cost of a product is that sum which is obtained by pricing a manufacturing specification of the product at predetermined basic rates for the materials, direct labour, and manufacturing expense entering into its manufacture.

Conceptions of the Term Standard.

There are two conceptions of the meaning of the term "Standard" as applied to the Standard Cost System:

- (a) Current—representing the ideal or par of performance, or

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(b) Basic—representing a rule or measure of accomplishment only.

(a) Current. In the first case standards are set up to represent the ideal of accomplishment—they must be changed from time to time to conform to the changes in material prices, in labour rates, and in manufacturing expense. The "ideal" standard is made up of the required proportions of materials, labour, and manufacturing expense for each product priced at the expected market prices for materials and labour and at current expense levels for factory burden. The result represents the ideal as to quantity, quality and expected cost and to continue to have it so, it must be changed to meet manufacturing conditions as they occur. The use as a measure of performance is also involved.

When "current" costs are used, inventories of work-in-process and finished goods may be carried on the books at Standard Cost, and differences between the actual costs and the current standards diverted directly to variance accounts.

Under this plan continual revision of the standards is of prime importance and is one of its serious disadvantages. It occasionally happens that the appeal of the "current" standard plan results in its adoption but the practical difficulties in the necessity of keeping the standards abreast of the various changes in material prices, labour rates, etc., result in a condition where such standards do not strictly reflect expected cost levels.

(b) Basic. In the second case standards are set up as a convenient means of establishing relative values, of determining variations from expectations, and the trend of such expectations. These standards need not be changed in conformity with current market changes, but only when formulae or manufacturing processes are altered. They are set up to represent the ideal combinations of quantities, but are priced at unchanging basic costs. As the costs of the required quantities are set up at fixed levels, in course of time these levels will not reflect current market conditions and instead of making a direct comparison between actual and standard costs, the results under this plan are read as comparisons of the extent and direction of changes in the actual costs in successive periods from standards set up at the same constant cost level.

The Standards are used as a basis and not as a "real" cost, inventories of work in process and finished goods are usually carried at actual costs. The corresponding standards may be carried beside them in parallel columns.

Double computations are necessary to determine the amount of the variations due to production inefficiencies.

Example. As an example these two methods of fixing standards, suppose that in 1940 standard costs were fixed for a certain material at the prevailing price of 100. At the beginning of 1942 the price of that material stands at 120. Under the Current Standards plan the material cost would be changed to the 1942 level, but under the basic plan it would not be so changed.

Therefore, in the case of a lot of material purchased in 1942 at a

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cost of 125—under the "current" standard the material cost would show a variance of 5 or a cost ratio of 104% while under the "basic" standard it would show a variance of 25 or a cost ratio of 125.

The trend of changes is available under the second method as the same basis is used from year to year, but the cost ratio does not directly reflect operating efficiency.

Compilation of a Standard Cost.

The success of a Standard Cost System depends very largely on the care and accuracy with which the Standards are established. They must be reasonable and attainable but must reflect production under highly efficient conditions. They must take into consideration market levels and tendencies, purchasing power, labour conditions, mechanical equipment and production possibilities. A careful survey of the entire business and of outside influences should be made and any changes which such a survey suggests and which will affect costs must be considered.

(a) Materials.

The setting of a standard material cost per unit involves the preparation of a complete list of the material used and a computation of the standard quantity multiplied by the standard price of each item.

Quantity standards are based upon engineering specifications, and test runs are made after the quantity to be used has been determined. The allowance should be made for necessary wastage or spoilage but not for controllable loss.

Price standards must take into consideration the present prices of the various grades, the effect of quantity buying, and the probable market tendencies for the budget period.

(b) Labour.

Standard Labour Costs per unit of product are based upon the Standard time for each operation multiplied by the Standard Rate to be Paid.

The operations required, the sequence of operations, and the machines or equipment used in each operation should be considered with a view to the effect of eliminations, additions or changes upon the cost.

Decision as to the standard operations required on each part is followed by determination of the standard time required for each operation. Time Standards are set after making time and motion studies of each operation. The Standard Time set should include any necessary waste motion and idle time but should not include any form of inefficiency.

Standard Wage rates must adhere to the actual labour rates which will be in existence during the coming period and a careful survey of the district labour market should be made. When piece-rates are paid the labour cost per piece or operation is a uniform amount, but where labour is paid on a time basis or where premium wage plans are in force, average rates must be determined based upon a fair rate of attainment for an efficient average worker. "Set-up" labour—the preparatory adjustment of machines and equipment in readiness for operation—may be important enough to be treated as a distinct operation. Hence, the number of units manufactured on a production order has a bearing on the cost which should be considered in establishing standards. Computations of costs will usually disclose the quantities which can be produced most economically and if these quantities do not result in overstocking they may be adopted as the normal quantities to be used in issuing production orders.

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Manufacturing Expense.

Two problems are involved in the setting of standard rates for the allocation of manufacturing expense—(a) the estimate of the expense to be incurred, and (b) the estimate of the quantity of production to be turned out in the coming period. Both estimates are more readily determined through an adequate system of budgetary control. The use of budgets, particularly variable budgets, is of greater importance in the preparation of overhead Standards than those for either Material or Labour.

Manufacturing Expense rates are established to absorb the estimated burden expenditure over the operations of the period at "Normal Capacity."

Budgets, which are the logical accompaniment of standard costs should be prepared for the coming period—year, if possible, divided into monthly periods—for

- (a) Sales
- (b) Quantity of Production
- (c) Factory Burden
- (d) Overhead Expense—Warehousing, shipping, selling, and administrative.
- (e) Profits.

Budgets of sales and production should be by product classes, on the basis of standard costs and with the normal profit margins. Budgets of Factory and Overhead Expenses should be prepared on the variable principle. **Revision of Standards.**

Provision must be made to revise the standards after they have been set up in accordance with the plan adopted. "Basic" standards will require adjustment only in the case of (a) the use of different materials, (b) a change in the material quantity or quality, (c) a change in the method or production, etc. "Current" standards will be adjusted, not only in the above instances, but also periodically to take into account changes in the material prices or wage rates, volume of production, etc.

Illustration of a Prepared "Standard Cost."

Illustration is attached showing the method of determination of the Standard Cost of a simple product.

Accounting for Standard Costs.

It may be considered sufficient to maintain statistical records of standard costs which are not incorporated as an essential part of the company's accounts.

On the other hand, it may be considered advisable to incorporate Standard Costs in the books of account, and to base the Financial Statements on the Standard Costs, particularly, when these represent current anticipated accomplishment.

In either case, information must be obtained of (a) Actual Costs, (b) Standard Costs, (c) Variances from Standard, and (d) Causes of and responsibility for the Variances.

Schedules of comparison between Actual and Standard Costs should be carefully analyzed, ratios prepared, and responsibility placed in anticipation of necessary corrective action.

Whether Standard Costs are incorporated in the general books or whether they are confined to statistical records, several different methods of procedure may be adopted. The most important of these are—

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- (A) Charging Work-in-Process accounts at actual costs and crediting them at standard costs—variances being determined at the end of each accounting period.
- (B) Charging and crediting Work-in-Process accounts at standard costs—variances being determined as transactions occur.
- (C) Incorporating Standard Costs in Subsidiary records only or as memorandum information on the general ledger accounts.

Let us presume that in Production Department A the Actual and Standard Costs of Product X are as follows—

	Actual Cost	Standard Cost
Material	\$ 155.40	\$ 152.00
Labour	140.60	135.00
Manufacturing Expense	99.10	90.00
	\$ 395.10	\$ 377.00

Figures have been taken showing, for all elements, Actual Cost as greater than Standard. Different conditions may be recorded without change in principle.

It is considered that Production has been completed. If it has not been, inventory of Work-in-Process would be taken into account.

Method A—Charging Work-in-Process Accounts at Actual Costs and crediting them at Standard Costs—variances determined at the end of each accounting period—("Current" Standards.)

- (a) Charges at actual cost are made to the Work-in-Process Accounts for Direct Materials from the Material Stores Account, for Direct Labour from the Payroll Account, and for Manufacturing Expense from the Expense Control Account.
- (b) Credits at Standard Costs are made to the Work-in-Process Accounts for all work completed during the period and transferred to Finished Goods.
- (c) Inventories of Work in Process are calculated at the end of the Accounting Period and priced at Standard Costs.
- (d) The Balance in the Work in Process accounts should correspond to the closing Work in Process inventories at Standard Cost—differences are carried as variances of material, labour, and overhead to the separate variance accounts, for later analysis and investigation.

Example—

1. Dr. Material in Process—Dept. A 155.40
 Labour " " — " B 140.60
 Mfg. Exp. " " — " C 99.10
 Cr. Stores 155.40
 Accrued Payroll 140.60
 Mfg. Expense Control Acct... 99.10
 Recording actual cost of each Product Group.
2. Dr. Finished Goods 377.00
 Cr. Material in Process— 152.00
 Dept. A
 Labour in Process— 135.00

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Dept. A	
Mfg. Exp. in Process—	90.00
Dept. A	

Recording completed production of each product group at Standard Costs.

3. Inventories of Work in Process—none in this case as production was completed.
4. Dr. Material Variance —Dept. A 3.40
 Labour Variance — " 5.60
 Mfg. Expense Variance— " 9.10
 Cr. Material in Process 3.40
 Labour " " 5.60
 Mfg. Exp. " " 9.10

Charging variations from Standard to special accounts denoting Manufacturing efficiency. A debit charge to the "Efficiency" accounts denotes an actual cost in excess of Standard, a credit vice versa.

Variances may be further divided into those due to usage, price level, etc. as set out more fully under Method B.

5. Dr. Profit & Loss—(Cost of Goods Sold) 18.10
 Cr. Material Variance —Dept. A 3.40
 Labour Variance — " 5.60
 Mfg. Expense Variance— " 9.10

At the end of the fiscal period variances may be carried to Profit and Loss Account, or may be charged directly against Production Costs as a debit to the Work-in-Process, Finished Goods and Cost of Goods Sold.

Under this method inventories of materials are carried at Actual Cost, and inventories of Work-in-Process and Finished Goods at Standard Cost.

Standards should reflect normal ideal of accomplishment—"Current" Standards).

Method B—Charging and Crediting Work in Process Accounts at Standard Costs.—Variances determined as transactions occur.—("Current" Standards).

This method requires more day-by-day accounting than does Method A but the management is given constant control over operations.

There are two methods of accounting for Materials under this plan, and brief summary and examples are given.

1. Charging Stores account at Actual Cost and converting prices to Standard at time of Issue.

Materials Purchased are charged to Stores as received at Actual Cost:—

Stores	155.40
Accounts Payable	155.40

At the time of Issue, the Material in Process accounts are charged at Standard Cost and Variance Accounts are set up for Variations from Standard in the Price and the Quantity of Materials used.

Materials in Process —Dept. A	152.00
Material Variance—Price — "	1.10
Material Variance—Quantity— "	2.30

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Stores	155.40
Stores inventory is carried at Actual Cost.	
2. Charging Stores Account at Standard Price—diverting Variations from Standard Prices to Material Price Variance Accounts at once.	
Materials Purchased are charged to Stores as received at Standard Price and Variance Accounts collect differences in price at once.	
Stores	154.30
Material Variance—Price	1.10
Accounts Payable	155.40

At the time of Issue Work in Process account is charged at Standard Cost and any difference in quantity from Standard is charged to a Material Quantity Variance Account.

Materials in Process—Dept. A	152.00
Material Variance—Quantity—Dept. A	2.30
Stores	154.30
Stores Inventory is carried at Standard Cost.	

Labour is charged to Work in Process at Standard and variances in Time used and in Wage Rates, as disclosed by the Time Cards and the Payrolls, are diverted to proper Variance Accounts.

Let us consider that the Details of Labour in our example were as follows—

Actual Labour expended—190 hours @ 74c	
per hour	140.60
Standard Labour for that production—180	
hours @ 75c per hour	135.00
Labour in Process—Dept. A	135.00
Labour Variance—Time—Dept. A	7.50
10 hours @ 75c	
Labour Variance — Wage Level —	
Dept. A	1.90
190 Hours @ 1c	
Accrued Payroll	140.60

Due to the nature of the manufacturing expense charges difficulty is encountered if attempt is made to divert manufacturing expense variances before the end of the monthly accounting period. The usual plan is to apply manufacturing expense to production as in a general cost system on the basis of man hours, machine hours, or direct labour cost, debiting manufacturing Expense-in-Process and crediting Applied Manufacturing Expense. Actual expense is charged as incurred, in total to Manufacturing Expense Control Account, and in detail to Manufacturing Expense Standing Orders.

At the end of the Period the difference between the Debit in the Mfg. Expense Control Account and the credit in the Applied Mfg. Expense Account represents the amount of the overhead variances which may be separated into (a) Expense Variance, (b) Idle Capacity Variance, and (c) Production Efficiency Variance.

Let us consider that the details of Mfg. expense in our example were as follows—

Actual overhead incurred during period	\$ 99.10
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Standard overhead on Budgeted Production for this period— —196 direct labour hours @ 50c	98.00
Actual Direct Labour Hours for the Period — 190 d.l. hrs.	
Standard Direct Labour Hours for the Production of the Period180 d.l. hrs.	

Manufacturing Expense in this case is charged to Work in Process on the basis of production as represented by the Standard D. L. Hours.

The Accounting entries would be as follows—

(a) Manufacturing Expense Control Account—Dept. A.....	99.10	
Accounts Payable, etc.		99.10
Actual overhead incurred during the period.		
(b) Manufacturing Expense in Process—Dept. A	90.00	
Standard Mfg. Expense Account		90.00
Overhead applied to production— 180 d.l. hrs. @ 50c		
(c) Standard Mfg. Expense Account	90.00	
Mfg. Expense Control Account		90.00
Transferring Standard Expense to Actual Expense Account—dis- closing a total Mfg. expense cost variance of 9.10.		
(d) Mfg. Expense—Dept. A—Expenditure Variance	1.10	
Mfg. Expense Control Account		1.10
Difference between actual Expense of 99.10 and budgeted expense of \$98.00.		
(e) Mfg. Exp. Dept. A—Idle Capacity Variance	3.00	
Mfg. Expense Control Account		3.00
Difference between Expense on basis of Budgeted Labour Hours (196)— and on basis of actual labour hours (190).		
(f) Mfg. Exp. Dept. A—Production Efficiency Variance	5.00	
Mfg. Expense Control Account		5.00
Difference between Expense on basis of actual labour hours (190) and Standard labour hours for that production (180).		

Work in Process Accounts.

Standard Cost Accounting, when incorporated as a part of the general accounting system, does not attempt to show details of Job or Order Costs. The main object is to ascertain effectiveness in performance, by processes, separately for the two functions of spending and producing. Multiplacation of Work-in-Progress Accounts will give analysis of such performance (a) by elements of cost, (b) by product classes, (c) by departments or (d) by any combinations of the above divisions, and the division of Work in Process accounts to be used should be carefully considered.

Method C—Incorporating Standard Costs in Subsidiary records only or as memorandum information on the general ledger accounts.—("Current" or "Basic" Standards.)

Much Standard Cost Accounting is done by the incorporation of Standard Costs as additional information in the Subsidiary Records or in the General Ledger Accounts. The effective entries in the General Ledger will record actual costs only and inventories of Stores, Work in Process and Finished Goods will be determined on the actual cost Basis.

This method of employing Standard Costs is extensively used, particularly in Job Cost Accounting, and while Standards may not be a part of the

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regular accounts nor included in the Financial Statements, the comparison between Actual and Standard costs may be made and the variances readily set up. Variances will not require any entry, in this case, on the books of account.

Standards may represent either "Current" or "Basic" Costs.

Two plans may be used in recording Standards as statistical information.

(A) Including Standard Costs on Production Orders only—

—after Standard Costs have been determined, they may be inserted in columns provided on the Production Orders. As production advances actual costs are recorded and on completion variances may be extended.

(B) Including Standard Costs in Journals and Ledger Accounts—

—Journals are arranged with two sets of debit and credit columns—1. actual and 2. standard—and the necessary Ledger Accounts with three sets of debit and credit columns—I. actual, II. standard, and III. variance.

This method involves a large amount of detailed accounting and requires inclusion of standard and actual cost figures on all original records such as material requisitions, labour reports, production orders, etc.

Cost Ratios

The relationship between actual performance and cost Standards may be shown in the form of percentage or "Cost Ratios".

Where "Current" Standards are used Cost Ratios will express operating efficiencies directly.

Where "Basic" Standards are used they represent units of measurement only and it must be borne in mind that the difference between actual and standard costs are not to be regarded as measures of effectiveness but include the effects of normal cost changes which have not been applied to the Standards.

It is easier for the average man to understand statements wherein the standards, with which actual results are to be compared, represent expected results. Therefore, it is always advisable to be careful when presenting figures to bring out clearly the level of expected performance.

The two factors may be segregated by the introduction of an intermediate step which will show the ratio of the present expected cost to the standard. The percentage resulting, applied to the cost ratios as originally calculated, will convert them into ratios reflecting current production efficiencies.

The periodic cost trend which is disclosed with the use of Basic Standards is valuable and may be advantageously studied and analyzed.

Example.

Let us presume that in the following example Standard Costs are "Current" and reflect expected performance.

We have the following information—

Materials.

(a) Actual Cost of Material Consumed	\$ 15,680
(b) Standard Cost of Materials specified for that production	14,000
(c) Standard Cost of Materials consumed	16,000

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Labour

(a) Actual Direct Labour Cost	\$ 21,168
28,224 hours at 75c	
(b) Standard Cost of Labour Budgeted for that Production	15,120
21,600 hours at 70c	

Manufacturing Expense.

(a) Actual Mfg. Expense incurred during period	\$ 23,840
(b) Standard Mfg. Expense on Budgeted production for that period	27,200
33,000 d.l. hours at 85c.	

Manufacturing Expense is applied to production on the basis of Direct Labour Hours.

Material Ratios.

I. Material Ratios.

$$\text{Material Cost Ratio} = \frac{\text{Actual Cost of Materials Consumed} \quad \$ 15,680}{\text{Standard Cost of Materials specified for that Production} \quad \$ 14,000} = 112$$

Actual Material Cost was therefore 112% of Standard Materials specified for that production.

This Variation is due to changes in

- (a) Material prices
- (b) Quantities of materials consumed.

II. Material Price Ratio.

$$\text{Material Price Ratio} = \frac{\text{Actual Cost of Materials Consumed} \quad \$ 15,680}{\text{Standard Cost of Materials Consumed} \quad \$ 16,000} = 98$$

Actual Material price is therefore 98% of the Standard Price set for those materials.

III. Material Quantity Ratio.

$$\text{Material Quantity Ratio} = \frac{\text{Standard Cost of Mtls. Consumed} \quad \$ 16,000}{\text{Standard Cost of Mtls. specified for that Production} \quad \$ 14,000} = 114.3$$

This ratio may be also calculated as follows—

$$\text{Material Quantity Ratio} = \frac{\text{Material Cost Ratio} \quad 112}{\text{Material Price Ratio} \quad 98} = 114.3$$

Any third ratio as above can be calculated from the first two ratios.

The Quantity of actual Materials consumed was therefore 114.3% of standard materials specified for that production.

Labour Ratios.

I. Labour Cost Ratio.

$$\text{Labour Cost Ratio} = \frac{\text{Actual Direct Labour Cost} \quad \$ 21,168}{\text{Standard Cost of Direct} \quad \$ 15,120} = 140$$

COST AND MANAGEMENT

Labour Budgeted for that
Production

Actual Labour Cost was therefore 40% above the Standard Budgeted for that Production.

This Variation is due to changes in

(a) Output per man hour—Labour Efficiency

(b) Rates of Wages Paid—Wage Level

II: Labour Efficiency.

$$\text{Labour Efficiency Ratio} = \frac{\text{Standard D. L. Hrs. specified for that Production} \quad 21,600 \text{ d.l. hrs.}}{\text{Actual Direct Labour Hours} \quad 28,224 \text{ d.l. hrs.}} = 76.5$$

Labour was therefore only 76.5% effective or the number of d.l. Hrs. used was 100

$$\frac{76.5}{100} = 130.7\% \text{ of the Standard.}$$

III. Wage Level.

$$\text{Wage Level Ratio} = \frac{\text{Actual Rate paid per d.l. hr.} \quad 75c}{\text{Standard Rate specified per d. l. hour} \quad 70c} = 107.1$$

The wage level was therefore 7.1% above the Standard.

This could also be calculated from the ratio previously determined as follows—

$$\text{Wage Level Ratio} = \frac{\text{Labour Cost Ratio} \quad 140}{\frac{\text{Ratio of d.l. hrs. used to Standard} \quad 130.7}} = 107.1$$

Manufacturing Expense Ratios.

I. Manufacturing Expense Cost Ratio.

$$\text{Mfg. Expense Cost Ratio} = \frac{\text{Actual Mfg. Exp. incurred during Period} \quad \$ 23,840}{\text{Standard Mfg. Expense on Budgeted Production for that Period} \quad \$ 27,200} = 87.6$$

Actual Mfg. Expense was therefore 87.6% of the Standard Mfg. Expense on the Budgeted Production for that Period.

This variation was due to the following—

- (a) Amount by which level of production was less than that Budgeted—Idle Capacity.
- (b) Amount by which Actual Mfg. Expense incurred differed from the standard for that production—Expenditure Ratio.
- (c) Amount by which actual labour hours differed from standard labour hours for that production—Production or Labour Efficiency.

II. Mfg. Exp.—Idle Capacity Ratio.

PRINCIPLES OF STANDARD COSTS

$$\text{Capacity Ratio} = \frac{\text{Actual d.l. hours}}{\text{Budgeted d.l. hours}} = \frac{28,224 \text{ d.l. hrs.}}{32,000 \text{ d.l. hrs.}} = 88.2$$

Actual d. l. hours used was 88.2% of d. l. hours budgeted, or idle capacity was 11.8%.

III. Mfg. Expense—Expenditure Ratio.

$$\begin{aligned} \text{Expenditure Ratio} &= \frac{\text{Actual Mfg. Expense Incurred during Period}}{\text{Standard Mfg. Exp. rate per D. L. Hour}} \\ &= \frac{\text{Actual d.l. hours used} \times \$ 23,840}{28,224 \text{ d.l. hrs.}} \div 85c = 84.47c \div 85c = 99.4 \end{aligned}$$

The actual Mfg. Expense expenditure per d.l. hour was 99.4% of the Standard.

This ratio may also be calculated as follows—

$$\text{Expenditure Ratio} = \frac{\text{Mfg. Exp. Cost Ratio}}{\text{Mfg. Exp. Idle Capacity Ratio}} = \frac{87.6}{88.2} = 99.4$$

IV. Manufacturing Expense—Production or Labour Efficiency Ratio.

Labour Efficiency Ratio was determined in discussing direct labour above as 76.5—the ratio between the standard d.l. hours specified for that production and the actual d.l. hours used.

This ratio has not been taken into consideration in this example as it has been stated that Manufacturing Expense was applied on the basis of actual direct labour hours used.

Where Manufacturing Expense is applied on the basis of Production or on Standard Direct Labour Hours for that Production, as where Standard Costs are charged in the Ledger to Work in Process Accounts, the Manufacturing expense cost ratio would be affected by the Production Efficiency ratio.

Sundry Ratios.

No single variance ratio can be intelligently studied by itself—each must be considered in relation to others and set up in comparison with them.

Other ratios are often determined, in addition to those noted above, including the following—

- (a) Ratio of machine efficiency
- (b) Ratio of crew efficiency
- (c) Relation of man efficiency to wage level
- (d) Sundry ratios for operations subsequent to manufacture.

Responsibility for Variances.

After the extent of variations from Standards have been determined they should be very carefully analyzed, responsibility placed, and any required corrective action taken. Each supervisor or executive should be constantly reminded that he is responsible for variations which are under his control. The monthly summary of responsibility is a most effective means of doing this.

Responsibility for some of the more obvious variations from standards may be placed as follows—

- (1) Variations due to price differences —purchasing dept.

COST AND MANAGEMENT

- | | |
|--|--|
| (2) Variations due to difference in grade or quality of material | —purchasing dept.
production dept. |
| (3) Variations in quantity of material consumed | —production dept.
—definite dept.
concerned. |
| (4) Variations in labour cost due to differences in wage rates | —employment or
production dept. |
| (5) Variations in labour cost due to time required if standard method is used | —production dept.
—definite dept.
concerned. |
| (6) Variations in labour cost due to changes of or experiment in methods of production | —administrative or
production dept. |
| (7) Variations in amount of production | —dept. foreman, production manager
or sales dept. |

"Statement of Responsibility for Variations from Standard Costs" may then be prepared—a simple example follows—

	Standard	Actual	Inc.	Dec.	Manufacturing		Purchasing		Employment	
					Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
Material	8.96	9.30	.34		.64			.30		
Labour	7.68	5.40		2.28		1.92				.36
TOTAL	52.64	55.20	4.84	2.28	4.74	1.92		.30	.80	.76
	4.20	6.40	2.20		1.40				.80	
	4.80	5.60	.80		1.20					.40
Mfg. Exp.	27.00	28.50	1.50		1.50					
Net Change	2.56			2.56	2.82	.30				.04

Disposition of Variances on the Accounts.

When Standard Costs form a part of the Accounting System disposition must be made of the amounts showing in the variance accounts at the end of the accounting period.

A variety of methods are followed of which the more important are—

(a) Carrying all variances to the Profit and Loss Account and showing them as a separate group of items on the Profit and Loss Statement.

(b) Carrying all variances to Profit and Loss except Material Price Variances which are prorated over Materials in Process Inventory, Finished Goods Inventory, and cost of Goods Sold.

(c) Carrying I. to Inventories and Cost of Goods Sold Variances resulting from Incorrect Standards, Material Price changes, and variations in Wage Levels and II. to Profit and Loss variances in Material Quantities, Labour Time, or Manufacturing Expense.

Organization and Certification.

During the process of drawing up the accounting plan, attention must be directed to the following—

- (a) system of codification and identification of articles and records.
- (b) organization to insure prompt and reliable reports.
- (c) scheduling routine of clerical work—with provision for peak and slack periods.
- (d) instructing personnel in the necessary procedure.

Standard Cost Statements and Reports.

The type of Standard Cost accounting system adopted is an important factor in setting up the production and operating statements. The disposition of Variances, in particular, will affect the form in which those statements should be presented.

A flow of Cost Reports prepared at short intervals should direct the

PRINCIPLES OF STANDARD COSTS

attention of the supervisors and management to quantities of production, variances from standard and other matters requiring their early attention. **Standards in Valuation of Inventories.**

Standard Costs are used in many cost systems in the valuation of all or some of the inventories of materials, work in process, and finished goods.

Some discussion has been directed against this practice. It has been contended that the accounts should reflect conditions as they are and not as they normally should be, that the lower of cost or market valuation coincides with the principle of accountancy to provide for all losses and anticipate no profits, and that inventories at Standard Cost should have no place in Financial Statements attempting as they do to present the actual condition of the business.

Inventory Valuation at Standard Cost is upheld on the following grounds—

- (a) Standard Costs reflect costs as they should be without additions for inefficiencies, etc.
- (b) Inventory value is constant and not affected by market variations.
- (c) There is a saving of time and energy in closing the books.
- (d) Valuation coincides with accounts where Standard Costs are used throughout.

Standard Costs as a Basis for Selling Price.

Standard Costs are determined in advance of production and provide a valuable aid in arriving at Selling Prices where these, also, must be arrived at in advance.

Standard Costs even cut the wide fluctuations which may occur in actual costs due to varying volumes of production in different seasons of the year and provide a more uniform basis on which selling prices may be built up. **Conclusion.**

The benefits resulting from the application of Standard Costs are manifold. Great care, however, must be exercised in their installation and in applying the principles to practical conditions. The element of personal judgement enters largely into the determination of standards and errors in judgement may cause serious misstatements of cost. The application of rigid standards under varying conditions may lead to injustice and inaccuracies unless the system is carefully adjusted and controlled. Standard Costs should only be adopted when it is clearly demonstrated that they are in accordance with the requirements of the business and applicable to its operations.

Acknowledgements W. B. Lawrence—Cost Accounting.
E. A. Camman—Basic Standard Costs.
J. G. Blocker—Cost Accounting.
C. L. VanSickle—Cost Accounting.

PERSONAL NOTES

It was with extreme regret that we heard of the death of R. R. "Bob" McLachlan, a prominent member of the Niagara Chapter. It was this writer's privilege to count Bob McLachlan a friend. He was extremely interested in the work of the Society, particularly where it concerned Students, and not only the Niagara Chapter, but the whole Society and this writer in particular, will miss him. We extend the sincere sympathy of the Society to his sorrowing family.

OTTAWA CHAPTER

At a meeting held on Friday, November 15th, at the Chateau Laurier, the Ottawa Chapter of the Society was organized.

Due to bad weather the attendance was not as large as had been expected, but those present heard a most instructive and interesting talk by Mr. T. M. Moran, of Stevenson & Kellogg Ltd., Montreal.

Mr. Moran who is at present attached to the Air Ministry on Special Organization work, addressed the gathering on "Recent Trends in Industrial Management", and his talk, illustrated by lantern slides was extremely well received.

Loud applause greeted Mr. Moran at the conclusion of his address and he was cordially thanked by the Chairman.

The following became Provisional Directors of the new Chapter:—C. A. L. Poudrier, N. Wrigglesworth, R. F. Bruce-Taylor, F.C.A.; F. E. Wood, J. D. Benson, V. M. Campbell and M. A. Kranch.

Following the meeting the new Directors held a session with the Secretary Manager of the Society and C. A. L. Poudrier, a former Chairman of the Vancouver Chapter, now engaged with the Air Ministry, was appointed Chairman pro tem.

Cost and Industrial Accountants

There is no time like the present to commence preparations for the spring examinations in Bookkeeping, Accounting, Cost Accounting and Business Organization and Management, held by the Canadian Society of Cost Accountants and Industrial Engineers. The Shaw course will prepare you for these examinations and a postcard will quickly obtain complete information.

**PREPARE NOW
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Literature Received

Cost Accountancy is Not Enough.

The Federal Accountant. September.

A very short article with which many Cost Accountants will not agree but which nevertheless should be read by all.

The Profit and Loss Forecast.

The Australian Accountant. October.

A most timely and instructive article on a subject which is much to the fore.

Incentive Plan for a Trading Business.

N.A.C.A. October 15.

Deals with incentive methods for all employees of a Trading Business.

Accounting for the Distribution of

Motion Picture Productions.

N.A.C.A. October 15.

This article is most interesting and presents problems which should be of interest to all Accountants.

Provisions in Defence Contracts.

N.A.C.A. November 1.

A most timely and interesting article especially in view of the vast amount of government work being undertaken and the vast number of government contracts at the present time.

Accounting Problems of Government War Contracts.

Journal of Accountancy. November.

Another very interesting article on a subject of much concern at the present time.

Distribution Costs—Present Method of Cost Analysis.

Journal of Accountancy. November.

A very complete and interesting article on a subject much in question at the present time.

Chapter Notes

Montreal Chapter.

Well over two hundred members and guests attended the dinner meeting of the Montreal Chapter held at the Windsor Hotel on October 31st, when the guest speaker was Hon. Arthur Mathewson, K.C., Provincial Treasurer.

At the head table were such guests as Jackson Dodds, General Manager, Bank of Montreal; G. Dobson, General Manager, Royal Bank of Canada, and C. S. Pierre, General Manager, Banque Canadienne Nationale.

The following is a fairly complete account of the address by Mr. Mathewson, included in this issue because it is of special interest.

"Perhaps I can give some immediate assurance," he said, "qualified to a certain degree, in speaking of the personal income tax paid by the citizens of Montreal, apart from the provincial income tax. That is a tax that must disappear, and if the necessary adjustment of the city's means can be made by equivalent revenue or, what is even better, equivalent reduction in ex-

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penditures, then that tax certainly will disappear; and I think I am not over sanguine when I tell you, I am morally certain that that result will be achieved.

Assist Montreal.

"Let me say in parenthesis," he went on, "just a word about Montreal, because the prosperity of Montreal has a very direct effect upon the prosperity of the province. Half the population of Quebec is centred in Montreal. This Montreal, which is the natural metropolis of Canada, has perhaps lost some of its lead. It is the desire of the province to assist Montreal to regain its proper place as metropolis of Canada. Far from desiring to interfere in the progress of Montreal or its administration we have felt only that it was our duty to prevent harm being done the metropolis in the financial realm. We have taken steps which were drastic, but they were necessary and we did what took a certain amount of political courage, which I assure you is not lacking in Mr. Godbout or anyone near him. I am glad to be able to say that the affairs of Montreal are in strong and competent hands and that already real progress has been made in bringing order out of chaos and arranging for the future.

Encouraging Picture.

Taxes, he conceded, always depressed a country. "None is more conscious of it than your humble servant, and my colleagues in the cabinet. We are aware that taxes are a detriment, but we consider it our duty to put such taxes as are necessary, first as to their substance, such as are necessary in order that debts to the province shall be honoured to the last cent, as they always will be; and secondly, as to the form of taxes, we have elected to put them on the broadest basis, as far as possible, and on the surface. Instead of devising hidden taxes, we have thought it our duty to put taxes on the table and let the people know what they are doing.

Expand Taxes.

"If you want to expand expenditures, then you must expand taxes also. This is a democratic country and the people are entitled to, and will have, the form of government they desire, and if it is the desire of the people who pay the taxes, to spend more money, then they can do it, but they will do it knowingly, under the present Government, because if there are more expenditures there must be more taxes. The thing is elementary."

In making a comparison between the first three months of the current fiscal year and that of a year ago, he conceded that this could not be taken as a perfectly accurate picture of the whole year. "You cost accountants know that it is unsafe and shows lack of comprehension to cut out a wedge shaped piece from the pie and say 'There is a sample, a quarter of the pie, the rest of the pie is like it.' Finances are not quite so simple as that. . . . There are inevitable complications, which you accountants know only too well."

With this reservation, he submitted the three months' picture thus: "On ordinary account, that is, expenditures other than capital expenditures for the first three months, disbursements were \$16,000,000 as against \$20,000,000 a year ago, or an improvement of about \$4,000,000.

"Receipts have run to \$24,500,000 as against about \$13,000,000. Consequently, on ordinary account, we have reversed the position. Where there

CHAPTER NOTES

was formerly a deficit of \$8,000,000, making a net change for the better of \$15,000,000.

Capital Account.

"Now on capital account, this year we have spent \$6,500,000 whereas in the first three months there had been spent the sum of \$9,500,000, showing a net reduction in capital expenditures of some \$3,000,000, making an overall improvement of \$18,000,000."

Mr. Mathewson opened his remarks with a short address in French, urging all English-speaking citizens to learn French, or, if they were too old to start that, to see that their children learned both languages.

J. Paul Rolland presided. D. R. Patton, C.A., proposed the toast of The Society. R. W. Louthood, A.C.I.S., introduced the speaker and Lorenzo Belanger, C.G.A., C.P.A., thanked him.

P. W. Wright, chairman of the education committee of the society, presented certificates to students who had passed qualifying examinations.

The next meeting of the Chapter is scheduled for November 15th, when Mr. Lloyd D. Brown, Production Manager, Noorduyn Aircraft Ltd., Montreal, will speak on "Cost Accounting in the Aircraft Industry". This meeting will be held at the Engineer's Club and it is to be hoped there will be a large attendance to hear Mr. Brown.

Toronto Chapter.

The Toronto Chapter turned up in force for the Joint Meeting at Hamilton on November 6th and thoroughly enjoyed the proceedings. The talk by Dominion President Don Patton was excellent, so was the entertainment and the hospitality of our Hamilton friends. This is one meeting that the Toronto members look forward to with a great deal of pleasure every fall and they were not disappointed. An unusually large number of Student members made the trip and this was especially gratifying. Harry Metcalfe had to leave the meeting for a few minutes in order to have a special coach attached to a later train than was originally arranged. This was due to the fact that the meeting and discussion lasted so long but all Toronto members at least reached Toronto safely.

Hamilton Chapter.

The Joint Meeting with Toronto, Hamilton, Niagara and Kitchener Chapters participating was held on November 6 at Roberts' Restaurant and was an unqualified success. The speaker was our Dominion President, Don Patton, C.A., who spoke on "The Problems of Aircraft Costing," and Don did himself proud. No less than 163 were present for the dinner with many more coming along for the meeting, and it was a fine gathering. After Chairman Wilf. McMahon had extended greetings to the visiting Chapters, Chairman Hal. Hetherington, of the Toronto Chapter, and Chairman Jim Thorpe, of the Niagara Chapter, expressed their gratification at being present. Past President Aleck Howey introduced the speaker, and Vice-President George Appleton extended a standing vote of thanks to the speaker. Mr. Paton's talk will appear in the December issue of "Cost and Management" so that no purpose can be served by discussing it here. However, it might be well to say that it was excellently delivered and very well received judging by the applause and the vote of thanks, as well as by the very intelligent discussion which ensued.

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The next meeting of the Hamilton Chapter will be on November 26, when members will travel to St. Catharines for a Joint Meeting with the Niagara Chapter.

Niagara Chapter.

The October meeting of the Niagara Chapter was a most successful one in every way. About twenty-seven members turned out for dinner and almost forty attended the meeting to hear Mr. E. H. Ottman, of The Bausch & Lambe Company, of Rochester, N.Y., speak on "Budgets". Mr. Ottman delivered a very interesting talk, supported by statistics, graphs and charts. The elaborate controls and most minute breakdown and research undertaken in the establishment of budgets by this firm brought forth many gasps. The discussion period showed with what interest the members had followed Mr. Ottman, who was the recipient of a very hearty vote of thanks. Owing to the short time available following this meeting, it was decided to postpone the organization of a Student Section until the November meeting.

Twenty-two members of the Chapter journeyed to Hamilton for the Joint Meeting on November 6th to hear President Don Patton, and had a delightful time. This was a good percentage of the membership, and the Chapter is to be congratulated on this achievement.

It is with extreme regret that we announce the death of R. R. "Bob" McLachlan, a prominent member of the Chapter, at a comparatively early age due to injuries sustained in the last war.

The November meeting of the Chapter will be held on November 26 at St. Catharines, when Mr. R. R. Renner, of Spencer Kellogg Company Inc., Buffalo, will speak on "The Last-In—First-Out Question". A large number of Hamilton members are expected to be present for this meeting which promises to live up to the high standard already set.

Kitchener Chapter.

The October meeting of the Kitchener Chapter saw forty members and guests present to hear Mr. C. B. Taylor, of Toronto, speak on the subject, "A New Tool of Management". Mr. Taylor supported his talk by means of lantern slides, which assisted very materially in describing the methods by which it is possible to break down results of salesmen's activities into profitable calls and sales. Mr. Taylor was compelled to answer numerous questions at the close, showing with what interest the members had listened to his talk and received a most hearty vote of thanks for his efforts.

London Chapter.

Dominion President Patton was the speaker at the meeting of the London Chapter held in the New Library on November 7th, and his topic, "The Distribution and Control of Overhead", was very well received. There were forty-five present for this meeting, and it is safe to say that everyone present thoroughly enjoyed the meeting and the discussion period. Mr. Patton was given a hearty welcome, and it can safely be said that he will be welcomed back to London any time he cares to come.

The December meeting will bring out Mr. W. J. Blackburn, of Hiram Walker & Sons, Walkerville, who will speak on "Use and Occupancy Insurance", and it is hoped that there will be a fine attendance to greet him.

STUDENT SECTION NEWS

Windsor Chapter.

The Windsor Chapter members turned out in large force to greet our Dominion President, D. R. Patton, C.A., on the evening of November 8th, and to hear his very instructive and enjoyable talk on "Standard Costs". About thirty were present for dinner and close to fifty for the meeting, and the discussion period was both long and interesting. Jim Masterson, an old friend of Mr. Patton, introduced him to the gathering, and Harry Cox, C.A., moved a hearty vote of thanks for his very fine talk.

Later this month members of the Chapter will pay a visit to the plant of the Dominion Glass Company at Wallaceburg through the very kind co-operation of Bill Jordan. Following the plant visit there will be a Turkey Dinner, and following that a talk by one of the executive members of the company. It promises to be an outstanding meeting and merits a large crowd.

Fort William-Port Arthur Chapter.

The October meeting of the Chapter was addressed by Mr. J. C. Hunter, of the Income Tax Department, Department of National Revenue, and the subject was "National Defence Tax and Excess Profits Tax". That the members were really interested was evident by the very fine and intelligent discussion which took place at the close. Thirty-three were present for this meeting.

The next meeting will be held on November 12 at Port Arthur, when Mr. F. H. Black, F.C.A., will be the speaker. His subject will be "Depreciation as Affected by Recent Government Legislation", and in view of the fact that Mr. Black has been appointed in an advisory capacity on depreciation to the Department of Munitions and Supply, it is easy to see that the members have a treat in store.

Student Section News

Toronto.

Owing to pressure of business, Douglas P. Bott, Secretary of the Toronto Student Section, has been compelled to resign from that office, and in his stead Grant McKnight, of the Canadian Gypsum Co. Ltd., has been elected. Max Coutts remains as Chairman and "Ab" Crocker as Vice-Chairman. Already three meetings have been held and all three have been very successful. Below we give the complete program for the season, and there is no doubt it is a very excellent one. A membership committee under the direction of Ab Crocker has been elected, and it is hoped that this will be the means of bringing many newcomers to this section. Meetings are held on every second Tuesday at the Canadian Military Institute, University Avenue.

Toronto Student Section Program.

1. Functions of Cost Accountant A. Blanchard
2. Bookkeeping R. Page
3. Maintenance and Repairs C. Warnes
4. Inventory Valuation R. Page
5. Wage Incentives R. Williams

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6. Expense Analysis	H. Metcalfe
7. Plant Insurance	Munty & Beatty
8. Heat, Light and Power Cost	Brickenden
9. Depreciation	R. S. Kellow
10. Budgetary Control	H. M. Hetherington
11. Standard Cost and Variation Analysis	A. Blanchard
12. Capital Structure of Companies	N. S. Caudwell
13. Accounting for Partnerships	J. F. Saunders
14. Appraisals	Mr. Ellis
15. Analysis of Financial Statements	S. H. Sorley

Hamilton.

Hamilton Student members continue their study of a Modern Industrial Plant, and although the attendance has not been what was expected, those who do attend are very keen.

At the last meeting, Student members of the Kitchener Chapter, accompanied by the Chairman and Past Chairman of the Chapter, attended in order to see exactly what we were studying, and they were so impressed that they intend to organize a Student Section immediately and will follow the idea of this Section.

Members of this Section will attend at least one meeting of the Kitchener Section later, and it is also planned to visit the Toronto Section, while the Chairman and Vice-Chairman will attend the first meeting of the newly organized Windsor Section.

It is hoped to have M. I. Long, C.A., give a talk to the members of the Hamilton Section on Tuesday, November 19, on "Principles of Depreciation".

London.

The London Section continues its set-up of a Modern Industrial Plant, a study which is proving of great interest. The Chairman and Secretary will likely visit the Windsor Section at its opening meeting shortly in order to advise just what they are doing.

Windsor.

The Windsor Chapter Student Section looks to have quite a future, judging by the enthusiasm displayed at the organization meeting on Friday, November 8th. Omer W. Cox, of Harrow, Ont., was appointed Chairman; Alex McGrath, of The Ford Motor Co. of Canada, was appointed Vice-Chairman, and Richard Nunn, of The Chrysler Corp. Ltd., Secretary. All these appointments are pro tem.

The first meeting of the Section will be held shortly and will be attended by the Secretary Manager of the Society and officers of the Hamilton and London Student Sections.

New Members

Montreal Chapter.

M. Godbout, Dominion Corset Co. Ltd., Quebec.

H. J. Pinsonnault, Dominion Corset Co. Ltd., Quebec.

R. W. Hebert, Dominion Rubber Co. Ltd., Montreal.

REPAIRS AND MAINTENANCE

A. F. Taylor, Can. International Paper Co. Ltd., Montreal.
J. L. P. Bergeon, Montreal.
F. H. Allcoren, Monitor Publishing Co. Ltd., Montreal.
R. S. Garber, Dominion Rubber Co. Ltd., Montreal.
L. E. Smart, British Rubber Co. of Canada Ltd., St. Lament, Que.
R. Breton, Penman's Ltd., St. Hyacinthe, Que.
J. H. Crossan, Underwood-Elliott-Fisher Ltd., Montreal.

Toronto Chapter.

H. J. Dennison, Steel Co. of Canada Ltd.
G. M. Walker, C. B. Taylor & Co.
A. D. Barraclough, Canadian Triangle Conduit Co. Ltd.
M. L. Ashmore, C.A., De Havilland Aircraft of Canada Ltd.
Harold Wilson, Pilkington Bros. (Canada) Ltd.
F. A. Young, C. B. Taylor & Co., Toronto.

Kitchener Chapter.

W. Brydges, Callender Fndry. & Mfg. Co. Ltd., Guelph.
M. Morton, Callender Fndry. & Mfg. Co. Ltd., Guelph.

London Chapter.

J. W. Long, Empire Brass Co. Ltd., London.

Windsor Chapter.

A. McGrath, Ford Motor Co. of Canada Ltd., Windsor.
T. N. McDowell, Ford Motor Co. of Canada Ltd., Windsor.

Repairs and Maintenance

An Address by C. WARNES, Canadian Kodak Co. Ltd., Before Toronto Students' Section, November 12, 1940.

QUESTION—How should we define Maintenance as applied to Industry?

Maintenance is "The Art of holding Real Property and Manufacturing Facilities in a state of high efficiency."

The growing burden being placed upon factory facilities as a result of the Defense Programme is making it imperative for Companies to keep adequate records on machines and other productive equipment.

Only when such records are kept in usable form can Management control the maintenance of machines, and only by reference to them can the best judgment be exercised when new equipment is purchased.

The Control of Maintenance Costs is an important factor in the operation of any manufacturing concern, and of vital importance in highly mechanized industries where a breakdown would disrupt production schedules.

A maintenance policy has of necessity a three-range point of view:

First—The repair procedure to take care of running repairs and breakdowns;

Second—The preventative procedure to maintain the entire Plant equipment in good operating condition over a period of years; and

Third—The need to have the total Maintenance Cost in keeping with the Factory income.

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In each factory of each industry with its own type and condition of equipment a proper balance must be struck among the three procedures.

Too little prevention means high repair costs, and production delays.

On the other hand—preventative maintenance in excess of the worth of the equipment or production volumes also means high maintenance costs.

The success or failure of the maintenance policy in a factory is in the balancing of the above three factors.

In most factories Management has set up and developed a separate division to handle all maintenance work, rather than continue the practice of having each production department do its own.

What are the duties of the maintenance division in the average modern plant?

It might be well to review them at this point:—

1. Upkeep of buildings, grounds and fences. Proper maintenance of these items keeps down the cost of repair and replacement, lessens depreciation, and eliminates many causes of accidents.
2. Fire and Plant Protection.
3. Make emergency repairs.
4. Make systematic inspection of machinery and equipment in order to detect anything which might cause breakdown or failure of equipment.
5. Keep tickler records of schedule of inspection.
6. Make repairs and replacements.
7. Make reports to the head of the operating division and production division as to needed repairs, and the date on which work on them will be started.
8. Most estimates on work costing more than a stipulated amount, and have them approved by the proper authority.
9. Suggest changes in design of machinery and equipment to eliminate excess wear and to reduce the number of repairs and adjustments.
10. Pass along information in regard to the care and operation of machinery and equipment.
11. Keep on hand and readily accessible a sufficient stock of materials, repair parts, and tools to take care of emergency repairs and routine maintenance work.
12. Timekeeping, costing and records.

I think you will agree with me that if no thought was given to preventative maintenance by a systematic inspection the duties of the maintenance division would be chiefly:

Make Emergency Repairs.

An Annual or Periodical overhaul of existing plant should always be a feature of a good, sound organization.

Cost Accountants are accustomed to think of Factory Costs in terms of Material, Labor and Overhead, and the element that most called for the skill and knowledge of the Cost Accountant was **Overhead**.

The tendency towards mechanization will be to lay more stress on the importance of preventative maintenance.

All Key Men of industry should be conscious of the relationship existing between good maintenance and low production costs.

A best method of manufacturing any product can not be developed through the use of run-down equipment.

REPAIRS AND MAINTENANCE

In order to control the cost of maintenance it is advisable to have a definite record showing the amount of money spent on maintenance in each department, and on each particular machine, and careful study should be given periodically to these figures to be sure that the expenditures do not become excessive.

Department Supervision is held responsible for his own department. Under a system of planned maintenance it is well to consider making certain repairs during periods of slack times, when it is possible to do things without interrupting, or being interrupted by production, and thereby get things in order for the time when work volume increases.

"Quick Service" is rightfully looked for on the part of the Maintenance Department, and in the repair factory machinery, as a shut-down of a few minutes results in losses in production which effect the ultimate cost of the product.

At this point it is my intention to explain as briefly as possible the system our Company uses in order to enable management to control as far as possible maintenance expenditures.

In the short time at my disposal it is out of the question to cover all the various phases in detail, but will endeavour to present to you some of the methods used in the control of repairs and maintenance, or the tie-in between the Engineering Department and Accounting Department before the charges are apportioned to the various products manufactured.

With the aid of Hollerith equipment many breakdowns can be made, periodical figures accumulated and information sent to the Plant Engineer's Office for control purposes.

Reporting Materials and Labor on Repairs and Requisitions.

General Plant Charges.

Direct Departmental Charges.

Minor Repairs—Details of Procedure

LABOR CONTROL

Minor Repairs and Maintenance—Less than 4 Hours' time, \$5.00 or under, Material Cost.

Department Superintendent:—Contacts foreman of shop concerned, requesting work to be done, and explaining nature of same.

He assigns a man to the job.

As he leaves the shop he takes a job card.

He punches an elapsed time clock which records the time of starting to the job.

When the job is completed, the Department Superintendent initials workman's card to show that the job has been completed to his satisfaction, and time taken to do the work meets with his approval.

At this time he marks on the job number.

On returning to his shop the workman punches the job card which records the time of his return to the shop.

He deposits the card in a receptacle near the clock, and at the same time punches a card for his next job.

At the end of the day all the workmens cards for each shop are turned in to the foreman for his approval.

The material is drawn from stock, on a card signed by the workman.

Materials used and time spent on job are checked by foreman, initialled and sent to E. & M. Office.

COST AND MANAGEMENT

In this office these cards are checked to make sure that each man has turned in sufficient cards to cover his full working day.

At the same time a record is made of the available working hours for each shop, showing the proportion of available time devoted to Minor Repairs.

The job number assigned by the shop foreman or department superintendent is checked to insure correct distribution of cost.

The job cards are then turned over to the Pay Roll Department.

The time for the day is checked against the daily clock cards by which the men are paid.

The Pay Roll Clerk figures the time as shown on the job card at his hourly rate, thus giving to us the cost of labor for the individual job. At the end of each week these cards are sent to the Tabulating Department where a Hollerith card is punched showing the following details:

Column 1—Department number by which the work has been done.

Column 2—Employee's number.

Column 3—Order number or Account number. (Indicating Department and class of equipment on which work has been done.)

Column 4—Total Labor charge.

Work Done on Requisition:—

In case of work which exceeds the 4 Hour and \$5.00 material limit.

It is necessary for the Department Superintendent to issue a requisition to the E. & M. Department to do the work (giving a brief statement of why the work is necessary).

This requisition is sent to the Plant Engineer's Office.

Before an order can be issued it is necessary to decide whether design is involved or specification of materials to be used is required.

If the order is of a more or less routine nature the order would be sent by the Plant Engineer to the shop detailed to do the job.

This work is investigated by the Shop Foreman and an estimate made of time and material required, and returned to the E. & M. Office, where upon approval the necessary order is issued to the shops to do the work.

For work of a very repetitive nature an open order number is allotted, similar to the minor repairs, and the cost is controlled by having the department superintendent approve each card at the time work is done.

Minor Repairs and Maintenance.

Each department throughout the Plant is allotted a number—Buildings, 100-199; Departments, 200-350.

Each class of work has a number, from "1-99",

such as 03 Floors	18 Steam Lines
05 Doors	31 Radiators
06 Windows	51 Sprinklers

This detailed classification is set up for control purposes, and is approved and initialled by the department superintendent.

Items on Requisitions—Over 4 Hours' time and over \$5.00 Material Charge.

A special set of numbers is used on requisitions—from "6000-9000".

These are also classified according to departments, and classes of work similar to Minor Repairs.

REPAIRS AND MAINTENANCE

All requisitions are checked and approved by the E. & M. Department. Special numbers are allotted to Motors and Machines. These numbers are used similar to requisitions for accumulating cost of maintenance.

Department superintendents approve and check department charges.

The Plant Engineer keeps a constant check on Plant and Manufacturing Burden charges, Maintenance of Yard and Janitor Services.

Tabulating Department.

Take the actual time cards from shops:

- Machine Shop
- Carpenters' Shop.
- Pipe Shop.
- Sheet Metal Shop.
- Electrical Shop.

Punch Hollerith cards for:

- Minor Repairs
- Requisitions
- Special Numbers,—of Motors and Machines.

These are tabulated, giving all details and departmental labor charges for the period.

Materials are kept in stores, centrally located in the plant, and requisitioned on special cards. Each item is priced and extended from perpetual Inventory Records kept in the Accounting Department.

These cards are sent to the Tabulating Department, where Hollerith Cards are punched showing:

- Date issued
- Stock Section Number
- Department
- Job, or Requisition, Number
- Value of Materials used.

The Accounting Department lists the above information, adding:

- Expense (Shop Overhead)
- Janitor
- Garage
- Labor
- Stock (Purchased on Requisition).

These lists are returned to the Tabulating Department, and cards are punched and tabulation made.

- Total Department Charges=Maintenance=8900 for Budget.
- Analysis by kind of repair—(1-99).
- Special numbers.

A report by numerical classification of work is presented to each department superintendent each accounting period for control purposes.

The E. & M. charges are posted against the departmental number in the Cost Analysis Ledger, and are included in the department overhead.

Job Costs:—A fixed percentage of overhead may be applied and checked against the actual at definite periods.

Standard Costs:—Variable budgets are set up at varying levels of production and variances shown against actual performance.

COST AND MANAGEMENT

Process Costs:—Maintenance and Repairs are charged against process and apportioned to products on a basis suited to kind of production, such as:

Machine Minutes—Linear feet over the machine, Units Boxed, or Spools Spooled.

There may be a condition where maintenance comprises a large proportion of overhead, where machines require special attention. In such a case, maintenance is done by the Process Department, under the control of the Production Department Superintendent, and the time and materials direct into the Departmental Cost Classification.

Our Cost Analysis Ledger—Department Sub-Accounts:

211—Direct Materials by Kinds or Groups.

Labor—Direct

Indirect

Supervision

214—Departmental Expense

215—M. & F. Repairs

General Burden

Power

Depreciation.

In the manufacture of, say Motion Picture Film, there are many processes. Against each of these departments we have:

Silver Nitrate Department	M. & F. Repairs
Emulsion Department	" "
Film Coating Department	" "
Film Slitting Department	" "
Film Perforating Department	" "
Film Boxing, Wrapping and	" "
Labelling	" "

Each of these departments assist in the manufacture of this product,—each turn out varying volumes of production.

It is very important that the M. & F. charges be classified correctly before applying them against the processes of manufacture.

At each stage of production the Inventory in process is valued at Cost, the control of overhead is essential.

You can readily see the points mentioned—that the checking and approval of the workman's cards and job numbers, and the checking of requisitions by the Plant Engineer is the most important factor in the control and proper application of Maintenance and Repair Costs.

Costs are only as accurate as the information coming to the Accounting Department is dependable.

The passing of information back to the departments and Engineering Department as quickly as possible for control purposes calls for the best of co-operation between the Accounting and Engineering Departments.

